

Table S3 Barriers that impact asthma control in African children

Key:

Notes on this table:

- The study data has been grouped into thematic factors with multiple barriers; therefore, studies appear multiple times.
- Within each thematic factor, the studies are listed by the study design, quality score, size and the barriers they present.
- Barriers are colour coded according to the key below

Barriers associated with uncontrolled asthma	
Barriers that have null effect	
Complex or difficult to interpret	

Abbreviations

y	years	SPT	skin prick test	n	number of children
F	female	FeNo	fractional exhaled nitric oxide	x	number with outcome
M	male			N	number of children in population
				OR	odds ratio
				AMD	adjusted Mean difference
				m	missing
ICS	inhaled bronchodilator	AR	allergic rhinitis	CS	cross-sectional
SABA	short-acting beta-agonist	ETS	environmental tobacco smoke		
CA	controlled asthma	ACT	asthma control test	%	percent
UA	uncontrolled asthma				

Patient-related factors									
Study ID, Design, Quality Score	Country, Sample Size, Ages	Effect measure	Barrier definition	Effect value	95%CI or significance	Reference group or comparator	Analysis used	Adjustments or variables	Comments
Age									
Mpairwe H 2019 CS 10/10	Uganda N= 561 [m=8] 5-12 y n=338 13-17 y n=214 Age 5-18 y	AMD	13 -17 y	-1.07	-1.20 to -0.94 P < 0.0001	5-12 y	Multivariate analysis	Sex, regular physical exercise as recommended by WHO, area of residence 1st 5 years of life (rural, town or city), concurrent allergy,	
Garba 2014 CS 6/10	South Africa N=115 15-18y n=23 10-14y n=54 Age 4-19 y	x/n (%)	15-18 y	15-18y 11(47.8%) UA vs 10-14y 25(46.3%) UA	NS	10-14 y	χ ² test	None	
Gender									
Mpairwe H 2019 CS 10/10	Uganda N=561 [m=8] F n=292 M n=261 Age 5-18 y	OR	F	-0.54	NS	M	Multivariate analysis	Age, regular physical exercise as recommended by WHO, area of residence 1st 5 years of life (rural, town or city), concurrent allergy,	
Garba 2014 CS 6/10	South Africa N=115 F n=56 M n=59 Age 4-19 y	x/n (%)	F	F 26 (46.4%) UA vs M 25 (42.4%) UA	NS	M	χ ² test	None	
Asthma medication use									
Mpairwe H 2019 CS 10/10	Uganda N= 561 [m=8] CA n=307 UA n=246 Age 5-18 y	x/n (%)	Inhaled SABA Yes 100 (18.1%)	51 (16.6%) CA vs 49 (19.9%) UA	NS		χ ² test	No information	
			ICS Yes 37 (6.7%)	22 (7.2%) CA vs 15 (6.10%) UA	NS			No information	
			Steroid tablets Yes 149 (27.0%)	86 (28.1%) CA vs 63 (25.6%) UA	NS			No information	
			Neither salbutamol nor steroids Yes 225 (40.7%)	153 (49.8%) CA vs 72 (22.6%) UA	<0.0001		χ ² test	No information	Mpairwe et al. noted that of 307 children with well-controlled asthma, 153 (49.8%) reported not using salbutamol or steroids in any formulation, they suggested that perhaps they had mild asthma.
Ethnicity									
Garba 2014 CS 6/10	South Africa N=115 CA n=64 UA n=51 Age 4-19	x/n (%)	Black n= 99 (86.1%) Coloured n= 7(6.1%) White n= 5 (4.3%) Asian n= 4 (3.5%)	Black race 53 (82.1%) CA vs Black race 46 (90.2%) UA	NS		χ ² test	None	

Environmental related factors									
Study ID, Design, Quality Score	Country, Sample Size, Ages	Effect measure	Barrier definition	Effect value	95%CI or significance	Reference group or comparator	Analysis used	Adjustments or variables	Comments
City residence									
Mpairwe H 2019 CS 10/10	Uganda N= 561 [m=8] Rural n=71 Town n=433 City n=49 Ages 5-18y	OR	City dwelling in the first five years of life	-1.99	-3.69 to -0.29 p=0.02	Rural residence	Multivariate analysis	Age, sex, regular physical exercise as recommended by WHO, concurrent allergy	Mpairwe et al. notes that p-value = 0.06 was for town and city and p-value= 0.02 for city only.
Ayuk A 2018 CS 6/10	Nigeria N=207 Urban n=178 Rural n=28 Ages 4-18y	x/n (%)	Urban residence	Urban 56 (31.4%) UA vs Rural 9 (32.1%) UA	NS	Rural residence	Fisher's exact test	No information	
Triggers (Home)									
Garba B 2014 CS 6/10	South Africa N=115 CA n=64 UA n=51 Age 4-19	x/n (%)	Dust n= 46 (40%)	25 (54.3%) CA vs 21 (45.7%) UA	NS		χ ² test	None	
			Cockroach n= 39 (33.9%)	19 (48.7%) CA vs 20 (51.3%) UA	NS		χ ² test	None	
			Carpet n= 38 (33.0%)	17 (44.7%) CA vs 21 (55.3%) UA	NS		χ ² test	None	
			Pets n=26 (22.6%)	15 (57.7%) CA vs 11 (42.3%) UA	NS		χ ² test	None	
			Toys in bed n= 20 (17.4%)	9 (45.0%) CA vs 110 (55.0%) UA	NS		χ ² test	None	
			ETS n= 13 (11.3%)	6 (46.2%) CA vs 7 (53.8%) UA	NS		χ ² test	None	

	Healthcare-related factors								
Study ID, Design, Quality Score	Country, Sample Size, Ages	Effect measure	Barrier definition	Effect value	95%CI or significance	Reference group or comparator	Analysis used	Adjustments or variables	Comments
Access to medication									
Mpairwe H 2019 CS 10/10	Uganda N= 561 [m=8] CA n=307 UA n=246 Age 5-18 y	x/n (%)	ICS Yes n=37 (6.7%)	22 (7.2%) CA vs 15 (6.10%) UA	NS	Well-controlled asthma	χ^2 test	No information	
Mpairwe H 2019 CS 10/10	Uganda N= 561 [m=8] CA n=307 UA n=246 Age 5-18 y	x/n (%)	Inhaled SABA Yes n=100 (18.1%)	51 (16.6%) CA vs 49 (19.9%) UA	NS	Well-controlled asthma	χ^2 test	No information	
Mpairwe H 2019 CS 10/10	Uganda N= 561 [m=8] CA n=307 UA n=246 Age 5-18 y	x/n (%)	Neither salbutamol nor steroids Yes n=225 (40.7%)	153 (49.8%) CA vs 72 (29.3%) UA	p < 0.0001	Well controlled asthma	χ^2 test	No information	Mpairwe et al. noted that of 307 children with well-controlled asthma, 153 (49.8%) reported not using salbutamol or steroids in any formulation, they suggested that perhaps they had mild asthma.
Skin prick test									
Mpairwe H 2019 CS 10/10	Uganda N= 561 [m=8] ACT test scores N=553 [m=9] Negative n=244 Positive n=300 Ages 5-18y	OR	Positive SPT ≥ 3 mm	-0.51	-1.31 to 0.29 NS	Negative SPT <3mm	multivariate analysis	Age, sex, regular physical exercise as recommended by WHO, area of residence 1st 5 years of life (rural, town or city), concurrent allergy	
Fractional nitric oxide									
Mpairwe H 2019 CS 10/13	Uganda N= 561 ACT test scores N=553 [m=13] Normal n=335 Elevated n=195 Ages 5-18y	OR	Elevated value FeNo ≥ 35 ppb	0.42	-0.39 to 1.24 NS	Normal value FeNo <35ppb	multivariate analysis	Age, sex, regular physical exercise as recommended by WHO, area of residence 1st 5 years of life (rural, town or city), concurrent allergy	

	Comorbidities								
Study ID, Design, Quality Score	Country, Sample Size, Ages	Effect measure	Barrier definition	Effect value	95%CI or significance	Reference group or comparator	Analysis used	Adjustments or variables	Comments
Allergy									
Mpairwe H 2019 CS 10/10	Uganda N= 561 [m=8] ACT test scores N=553 [m=1] No n=434 Yes n=118 Ages 5-18y	OR	Concurrent AR	-1.33	-2.28 to -0.38 p= 0.006	No concurrent allergy	multivariate analysis	Age, sex, regular physical exercise as recommended by WHO, area of residence 1st 5 years of life (rural, town or city)	
Ayuk A 2018 CS 6/10	Nigeria N=207 No n=121 Yes n=86 Ages 4-18y	x/n (%)	Current allergy	Current allergy 26 (30.2%) UA vs No Allergy 38 (31.4%) UA	NS	No current allergy	Fisher's exact test	No information	